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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/987,932	11/16/2001	Chalmer G. Kirkbride	3495-7000US3	7958

7590 08/09/2005

MORGAN & FINNEGAN, L.L.P.
345 Park Avenue
New York, NY 10154

EXAMINER	
LEUNG, JENNIFER A	

ART UNIT	PAPER NUMBER
1764	

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/987,932	KIRKBRIDE ET AL.	
	Examiner	Art Unit	
	Jennifer A. Leung	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 May 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *23-54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *23-54* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/5/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 23, 2005 has been entered.

Response to Amendment

2. Applicant's amendment submitted on May 23, 2005 has been received and carefully considered. Claims 1-22 are cancelled. Claims 23-54 remain active.

Specification

3. The disclosure is objected to because of the following informalities:

Page 5, line 11: "FIG. 7 shows" should be changed to --FIG. 7A and FIG. 7B show--.

Page 23, line 23: "FIG. 7 shows" should be changed to --FIG. 7A and FIG. 7B show--.

Appropriate correction is required.

Drawings

4. The proposed changes to the drawings submitted on May 23, 2005 are acceptable. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37

CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 23-54 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claims 23 and 34, it is unclear as to where in applicant's disclosure support may be found for the newly added limitation of, "said reactor having an operating temperature in the range of about 50°F to about 1500°F," (lines 13-14). For example, the specification (page 8, lines 19-23) merely provides support for an operating temperature "between 800°F and 900°F, preferably closer to 800°F". In another example, the specification (page 17, line 17) merely provides support for a reaction temperature of "800.00 °F". In yet another example, the specification (page 25, lines 5-7) merely provides support for a "reaction temperature of about 900°F to about 1000°F". Please note that the temperature of "about 50 °F" is not a reactor operating temperature but merely a temperature of the incoming tar sand (see page 7, lines 9-13, and page 17, lines 14-16, of the specification). Also, please note that the temperature of "about

1500°F" is not a reactor operating temperature but merely a temperature of the incoming hydrogen (see page 24, line 24, to page 25, line 2, of the specification).

Additionally, it is unclear as to where in applicant's disclosure support may be found for the newly added negative limitation of a fluidized bed reactor "free of a contained catalyst bed and having a fluidized bed comprising substantially said feed," (lines 3-4). In particular, this limitation appears contradictory to applicant's specification (page 24, lines 1-6) which states,

> "The bitumen in the tar sand can contain heavy metals, such as nickel, which may catalytically promote endothermic and exothermic reactions in reactor **705**. However, supplemental catalyst such as, for example, nickel, cobalt, molybdenum, and vanadium can also be added through catalyst feed conduit **704A** to one of the feed lock hoppers **704** to assist catalysis provided by the heavy metals in the mined tar sand or shale."

The mere act of supplying a supplemental catalyst to the reactor will cause the supplemental catalyst to be "contained" in the reactor. Because the supplemental catalyst is fluidized with the feed material inside the reactor, the supplemental catalyst further defines a fluidized "bed" of catalyst. In addition, any negative limitation or exclusionary proviso must have basis in the original disclosure. If alternative elements are positively recited in the specification, they may be explicitly excluded in the claims. See *In re Johnson*, 558 F.2d 1008, 1019, 194 USPQ 187, 196 (CCPA 1977). *Assuming arguendo*, that the supplemental catalyst is an alternative element that may be explicitly excluded in the claims, the fluidized bed reactor would still not be "free of a contained catalyst bed", given that the specification discloses that the feed material contains heavy metals, such a nickel, which further defines a catalyst in the process.

Regarding claims 50 and 51, it is unclear as to where in applicant's disclosure support may be found for the limitation of, "said reactor having an operating temperature of about

1000°F or lower," (line 5). For example, the specification (page 8, lines 19-23) merely provides support for operating temperature of "between 800°F and 900°F, preferably closer to 800°F". In another example, the specification (page 17, line 17) merely provides support for a reaction temperature of "800.00 °F". In yet another example, the specification (page 25, lines 5-7) merely provides support for a "reaction temperature of about 900°F to about 1000°F".

Additionally, it is unclear as to where in applicant's disclosure support may be found for the limitation of, "an operating pressure of 450 psi or greater," (lines 5-6). For example, the specification (page 9, lines 1-3, and page 25, lines 5-7) merely provides support for a pressure of, "about 600 psi". Please note that the pressure of "450 psi" is not a reactor operating pressure but merely the pressure of the make-up fresh hydrogen or the recycle hydrogen, prior to compression (see page 14, lines 16-19, and page 29, lines 4-11, of the specification).

Additionally, it is unclear as to where in applicant's disclosure support may be found for the limitation of, "hydrogen fed to said reactor at a temperature of about 1500°F or lower," (lines 7-8). For example, the specification (page 13, lines 9-12; page 17, line 35; and page 20, line 30) merely provides support for a temperature of "about 1200°F". In another example, the specification (page 25, line 2) merely provides support for a temperature of "about 1500°F".

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 23-54 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 23, "said feed" (line 4) lacks proper positive antecedent basis because "a tar sand feed" is merely recited in the intended use clause of the preamble. Additionally, the recitation of "said fluidized bed comprises at least said fluidized feed comprising said tar sand" (lines 9-10) lacks proper positive antecedent basis, since the "tar sand feed" is merely recited in the intended use clause of the preamble and the "tar sand" is merely recited in the intended use clause for the feed inlet (lines 5-6). Additionally, "said fluidizing medium" (line 8) lacks proper positive antecedent basis.

Regarding claim 34, "said feed" (line 4) lacks proper positive antecedent basis. Also, "said fluidizing medium" (lines 7-8) lacks proper positive antecedent basis. Additionally, the recitation of, "said fluidized feed forming said fluidized bed in which said fluidized bed comprises at least said fluidized fed comprising said oil shale" (lines 9-10) lacks proper positive antecedent basis, since the "oil shale" is merely recited in the intended use clause of the preamble and the intended use clause for the feed inlet (lines 5-6).

Regarding claims 50 and 51, it is unclear as to the structural elements applicant is attempting to recite by, "said reactor system adapted to recycle a gas comprising hydrogen, and said reactor system adapted for control of a methane level by having a gas purge," (lines 10-11), because it has been held that the recitation that an element is "adapted to" perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 34, 35, 38, 40, 46, 47, 51 and 53 are rejected under 35 U.S.C. 102(b) as being anticipated by Weil et al. (US 3,891,403).

Regarding claims 34 and 53, Weil et al. (FIG. 1-3; generally, column 3, line 68 to column 9, line 14) discloses a reactor system comprising a fluidized bed reactor (i.e., hydrogasifier **10**, having "a series of fluidized beds which are heated by the upwardly moving or countercurrent flowing hydrogen rich gas," column 4, lines 2-25); said reactor **10** having a feed inlet for a fluidizable feed comprising an oil shale comprising kerogen (i.e., via line "OIL SHALE"); a fluidizing medium inlet for a gas comprising hydrogen (i.e., via line "H_2"); an outlet for a reactor product gas comprising a hydrocarbon (i.e., via line "VAPORIZED LIQUIDS"); and an outlet for solid (i.e., via line "SPENT SHALE"). The fluidized bed in the fluidized bed reactor **10** is free of a contained catalyst bed and substantially comprises the fluidized feed (i.e., the oil shale as fluidized by the upwardly moving hydrogen rich gas). The recited operating temperature of the reactor **10** provides no further patentable weight to the claim because the operating temperature is not an element of the apparatus but a process limitation. In any event, Weil et al. discloses an operating temperature in a range of about 50 to about 1500 °F (i.e., between about 300 and 1500 °F; column 4, lines 26-55).

Regarding claims 35 and 38, Weil et al. discloses, "The oil shale which is introduced to the reactor **10** has been previously subjected, in a conventional manner, to an oil shale crusher (not shown) for reducing the mined oil shale to the size of pebbles having a diameter in the range of about 1/4 - 1 inches." (column 4, lines 13-19).

Regarding claim 40, Weil et al. discloses a hydrogen recycling system positioned downstream for the gas outlet (i.e., comprising "METHANE-HYDROGEN SEPARATION" apparatus; see FIG. 2, 3).

Regarding claim 46, Weil et al. discloses a gas-liquid separator (i.e., comprising "LIQUID GAS SEPARATION" apparatus in FIG. 2, column 6, lines 43-49; also shown as "H_2O-GAS-LIQUID SEPARATION" apparatus in FIG. 3).

Regarding claim 47, Weil et al. discloses a scrubbing system (i.e., monoethanolamine scrubbing system; FIG.3; column 8, lines 54-60).

Regarding claim 51, the oil shale inherently comprises pieces capable of passing through a one inch mesh, because "The oil shale which is introduced to the reactor **10** has been previously subjected, in a conventional manner, to an oil shale crusher (not shown) for reducing the mined oil shale to the size of pebbles having a diameter in the range of about 1/4 - 1 inches." (column 4, lines 13-19). Also, the reactor system recycles hydrogen (i.e., via "METHANE-HYDROGEN SEPARATION" apparatus; FIG. 2, 3) and comprises a gas purge (i.e., CH_4, leaving as "PIPELINE GAS"; FIG. 1-3). The recited operating temperature and pressure of reactor **10** and the recited temperature of hydrogen fed provide no further patentable weight to the claim because temperature and pressure are process limitations. In any event, Weil et al. discloses an operating temperature of about 1000 °F or lower (see column 4, lines 26-55), an operating pressure of 450 psi or greater (see column 5, lines 12-20), and a hydrogen temperature inherently about 1500 °F or lower (see column 4, lines 48-55).

Instant claims 34, 35, 38, 40, 46, 47, 51 and 53 structurally read on the apparatus of Weil et al.

8. Claims 34, 35, 38, 40, 41, 43, 45-47 and 51 are rejected under 35 U.S.C. 102(b) as being anticipated by Schora et al. (US 4,560,547).

Regarding claim 34, Schora et al. (FIG. 1; column 4, line 56 to column 6, line 46) discloses a reactor system comprising a fluidized bed reactor (i.e., fluidized bed reactor **10**) having a feed inlet for a fluidizable feed comprising an oil shale comprising kerogen (i.e., raw oil shale fines via lock-hopper **21**); a fluidizing medium inlet for a gas comprising hydrogen (i.e., via conduit **24**); an outlet for a reactor product gas comprising a hydrocarbon (i.e., via conduit **18**); and an outlet for solid (i.e., via conduit **17**). The fluidized bed **11** is free of a contained catalyst bed and substantially comprises the fluidized feed (i.e., oil shale fines fluidized by hydrogen and other gases). The recited operating temperature provides no further patentable weight to the claim because the operating temperatures and pressure are not an element of the apparatus but a process limitation. In any event, Schora et al. discloses said reactor **10** having an operating temperature in a range of about 50 to about 1500 °F (column 5, lines 41-43).

Regarding claims 35 and 38, the feed comprises pieces having a dimension of 1 inch or less (i.e., an average diameter of less than about 0.125 inch; column 4, lines 51-55).

Regarding claim 40, Schora et al. discloses a hydrogen recycling system (i.e., comprising recycle conduits **24** and **49**; FIG. 1).

Regarding claim 41, Schora et al. discloses a separator (i.e., solids separator **40**; FIG. 1).

Regarding claim 43, the feed inlet (i.e., via hopper **21**, conveying line **23**) and fluidizing medium inlet (i.e., via conduit **24**) are positioned for co-current flow (see FIG. 1).

Regarding claims 45 and 46, Schora et al. discloses a heat exchanger (i.e., waste heat boiler **42**) and a gas-liquid separator (i.e., cooler-condenser **44**).

Regarding claim 47, Schora et al. discloses a scrubbing system (i.e., purification means **51**, wherein "raw product gas may first be treated in an acid gas removable plant where it is scrubbed..." column 6, lines 36-46).

Regarding claim 51, the feed inherently comprises pieces capable of passing through a one inch mesh (i.e., the feed has an average diameter of less than about 0.125 inch; column 4, lines 51-55). Also, the reactor system is adapted to recycle hydrogen (i.e., via conduits **24, 49**) and comprises a gas purge (i.e., via lines **34, 52**). The recited operating temperature and pressure of the reactor **10** and the recited temperature of the hydrogen provide no further patentable weight to the claim because the operating temperatures and pressure are not elements of the apparatus but process limitations. The apparatus of Schora thus structurally meets the claim.

Instant claims 34, 35, 38, 40, 41, 43, 45-47 and 51 structurally read on the apparatus of Schora et al.

9. Claims 23, 24, 29-31, 34, 35, 38-40, 45-47 and 50-54 are rejected under 35U.S.C. 102(b) as being anticipated by Tassoney et al. (US 3,715,301).

Regarding claims 23 and 34, Tassoney et al. (FIG. 1; column 8, line 31 to column 10, line 41) discloses a reactor system comprising a fluidized bed reactor (i.e., fluidized bed retort **17**) having a feed inlet (i.e., via line **16**), a fluidizing medium inlet (i.e., via line **18**), an outlet for a reactor product gas (i.e., via line **19**) and an outlet for solid (i.e., via line **38**); wherein the fluidized bed within the reactor **17** is free of a contained catalyst bed (i.e., the process is noncatalytic; column 3, lines 21-24) and comprises substantially the fluidized feed, said feed including solid carbonaceous fuels of oil shale (which inherently comprises kerogen) and tar sands (which inherently comprises bitumen). (see column 2, lines 10-21; column 3, lines 25-33).

Please note that the recited operating temperature provides no further patentable weight to the claims, because the operating temperature is not considered an element of the apparatus but a process limitation. In any event, Tassoney et al. discloses said reactor 17 having an operating temperature in a range of about 50 to about 1500 °F (column 2, lines 38-46).

Regarding claims 24 and 40, Tassoney et al. discloses a hydrogen recycling system (i.e., via lines **29**, **33**; column 9, lines 34-39).

Regarding claims 29 and 45, Tassoney et al. discloses a heat exchanger (i.e., heat exchanger **20**; column 9, lines 9-22).

Regarding claims 30 and 46, Tassoney et al. discloses a gas-liquid separator (i.e., gas-liquid separator **24**; column 9, lines 9-22).

Regarding claims 31 and 47, Tassoney et al. discloses a scrubbing system (i.e., "... particulate carbon are removed from the gas stream by scrubbing with water and leave the gas purification zone by way of line **63**," column 10, lines 25-41; column 6, lines 12-59).

Regarding claims 35 and 38, Tassoney et al. discloses a feed introducing system comprising a conventional grinder **2** for producing feed comprising fluidizable pieces of about 1/4 to 1/2 inch diameter (column 8, lines 41-53).

Regarding claims 39 and 54, Tassoney et al. discloses the feed introducing system (i.e., raw coal line **1**, grinder **2**, line **3**, mixer **4**, line **7** and pump **6**; FIG. 1) maintains the feed at a temperature of about 100 °F or lower (i.e., "At *ambient temperature* by means of pump **6**, the slurry is pumped through lines **7** and **8**, nozzle mixer **9** and line **10**," column 8, lines 49-58).

Regarding claims 50 and 51, Tassoney et al. discloses feed pieces that are inherently capable of passing through a one inch mesh (i.e., 1/4 to 1/2 inch average diameter pieces; column

8, lines 41-53). Also, the reactor system is adapted to recycle hydrogen (i.e., via lines **29, 33**) and comprises a gas purge (i.e., via line **65**). Please note that the recited operating temperature and pressure of the reactor **17** and the recited temperature of the hydrogen **18** provides no further patentable weight to the claims because temperatures and pressures are not considered elements of an apparatus but process limitations. The apparatus of Tassoney et al. thus meets the claims.

Regarding claims 52 and 53, Tassoney et al. discloses the feed inlet (i.e., via line **16**) and the fluidizing medium inlet (i.e., via line **18**) being positioned for countercurrent flow (FIG. 1).

Instant claims 23, 24, 29-31, 34, 35, 38-40, 45-47 and 50-54 structurally read on the apparatus of Tassoney et al.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 25, 26, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tassoney et al. (US 3,715,301) in view of Stratford (US 3,118,746).

Tassoney et al. is silent as to the reactor system comprising a cyclone separator for removing entrained solids from the reactor product gas in line **19**. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to provide a cyclone separator to the reactor system of Tassoney et al., on the basis of suitability for the intended use, because the provision of cyclone separators at the gas outlet of fluidized bed reactors for the removal of entrained solids is well known in the art, as evidenced by Stratford. In particular, Stratford (FIG. 1; column 2, lines 40-73) teaches a similar reactor system for producing synthetic fuel, wherein the reactor system comprises a fluidized bed reactor (i.e., conversion zone **2**) having an outlet for reactor product gas (i.e., via line **3**), and a cyclone separator **4** for removing entrained solids, such as powdered shale or ash, from the reactor product gas **3**.

11. Claims 27 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tassoney et al. (US 3,715,301) in view of Kalbach (US 2,639,982).

Tassoney et al. is silent as to whether the feed inlet **16** and fluidizing medium inlet **18** may be positioned for co-current flow (i.e., the flow is counter-current, see figure). In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to configure the feed inlet **16** and the fluidizing medium inlet **18** for co-current flow in the apparatus of Tassoney et al., on the basis of suitability for the intended use, because the shifting of location of parts merely involves routine skill in the art, and the use of fluidized bed reactors having a co-current flow configuration are conventionally known in the art, as evidenced by Kalbach. In particular, Kalbach (FIG.) teaches a reactor system for producing synthetic fuel from carbonaceous solids, wherein the reactor system comprises a fluidized bed reactor (i.e.,

hydrogenation reactor **1**) having a feed inlet (i.e., via line **18**) and a fluidizing medium inlet (i.e., via line **19**) positioned for co-current flow (See FIG.).

12. Claims 28, 32, 33, 44, 48 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tassoney et al. (US 3,715,301) in view of Schlinger et al. (US 3,224,954).

Tassoney et al. (Figure) discloses the hydrogen recycling system comprising a separating device (i.e., gas-liquid separator **24**) for removing a portion of the hydrocarbon from the reactor product gas (i.e., removing hydrocarbon **25** from the product gas **23**), thereby producing a gas comprising a recycle hydrogen fed to a recycle hydrogen gas stream (i.e., hydrogen recycle in stream **29** to **33**); wherein a compressor **34** pressurizes the recycle hydrogen in stream **33**. Make-up hydrogen is further generated in a synthesis gas generator **30** by partial oxidation. Tassoney et al., however, is silent as to the instantly recited configuration for the hydrogen recycling system. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to substitute other known, suitable, hydrogen recycling systems for the hydrogen recycling system in the apparatus of Tassoney et al., on the basis of suitability for the intended use, because the substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958). For instance, Schlinger et al. (FIG. 1; column 5, lines 28-36) teaches a conventionally known hydrogen recycling system according to the instantly recited configuration, wherein the hydrogen recycling system is incorporated into an apparatus for producing synthetic fuel from oil shale and the like, the hydrogen recycling system comprising a separating device (i.e., gas and liquid separator **8**) for removing a portion of hydrocarbon from the reactor product gas (i.e., a

hydrocarbon liquid product **12** being removed from a product gas **6**), thereby producing a gas comprising a recycle hydrogen fed to a recycle hydrogen gas stream (i.e., recycle line **9**); a make-up hydrogen feed stream (i.e., via line **11**); a mixing device for admixing recycle hydrogen **9** and make-up hydrogen **11** (i.e., at the mixing "T" defined by the intersection of lines **9** and **11**); a compressor having a recycle hydrogen feed and a make-up hydrogen feed (i.e., compressor **10**, which compresses hydrogen from lines **9** and **11**); and a heater **2** receiving the hydrogen mixture stream from compressor **10**.

13. Claims 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tassoney et al. (US 3,715,301) in view of Graf (US 3,915,395).

Tassoney et al. discloses that the feed introducing system comprises a conventional grinder **2**, for reducing the size of the feed to about a 1/4 to 1/2 inch average diameter (column 8, lines 48-51). Although Tassoney et al. does not specifically describe the apparatus comprising a screening device, some sort of screening device will be inherently present in the conventional grinders of the art, to enable to production of feed particles of the desired size. Such a screening device is evidenced by Graf. In particular, Graf teaches a conventional grinder (i.e., crusher machine **23**) for reducing the size of material such as coal, lignite, ore, stone, rock, oil shale and the like, wherein the grinder **23** comprises a screening device (i.e., apertured particle sizing means, which may be a grate **50**, including a screen, or other means having openings to pass smaller particles and reject lager particles provided in or in communication with rotor housing **23**; column 3, lines 50-55). It would have been further obvious for one of ordinary skill in the art at the time the invention was made to configure such a screening device to remove pieces of feed having a dimension greater than about 1 inch, in order to maintain the feed pieces within the

desired range of 1/4 to 1/2 inch average diameter, because changes in size merely involves routine skill in the art, and where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Response to Arguments

14. Applicant's arguments with respect to claims 23-54 have been considered but are moot in view of the new ground(s) of rejection, necessitated by amendment.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is (571) 272-1449. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer A. Leung
August 5, 2005

Hien Tran

HIEN TRAN
PRIMARY EXAMINER